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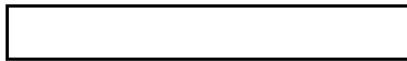
TENTH MONTHLY NARRATIVE REPORT

15 May 1965

REFERENCE

Contract 

Declass Review by NGA.



REPORTING INTERVAL

10 April 1965 - 10 May 1965

OBJECTIVE

The objective of this program is the design, construction, and testing of a prenormalizing system to be used for problems of automatic target identification on aerial imagery. The prenormalizer will scan the image and, by special filtering techniques, produce a set of measurements which have minimal change with translation and rotation of the specific image on the scene. Testing is to be accomplished on the CONFLEX I Adaptive Recognition System.

STATUS OF ACTIVITIES AND ACCOMPLISHMENTS

During this interval, the system was completed and testing operations were begun. The very first tests were concerned with verifying circuit functions on an individual basis. Test imagery included simple spoked lines and parallel grids of various sizes. The system response to these images was as predicted. Preliminary and secondary filter responses and the D-cell sampling processes were all checked out.

Initial tests were then made using high contrast simulated airport and railroad imagery. The system responses to these images were quite strong and distinctive. It was noted that images of single runways produce weak responses, pointing up the lack of sensitivity which resulted when noise rejection was effected in the D-cell threshold circuits.

Finally, preliminary tests were made in which airplane images and views of residential housing were scanned by the system. In these tests, as in all previous tests, the responses were not substantially changed when images were rotated. The representations of the aerial imagery were not as distinctive as they should have been, again because of the system noise which will be discussed below.

Attempts are still being made to gather aerial photography which will constitute a reasonable data base in final experiments. A brief conference with [REDACTED] RADC, was held in this interval. He shared our enthusiasm toward collecting the data base but, as yet, has been unable to collect the necessary material to constitute this base. We are proceeding to process photography supplied by the sponsor in order to carry out our own experiments with the prenormalizing system.

TIME SPENT ON PROJECT (CUMULATIVE TOTAL)

	217 Hours
	628 Hours

TECHNICAL AGREEMENTS MADE

None

### DIFFICULTIES ENCOUNTERED

The system noise problem alluded to in a previous paragraph is being investigated. This noise has several sources.

- ① Samples of the 400 analog variables are taken through 800 sample gates and diverted to one of two sides of a differential amplifier. The switching of these 800 gates every three microseconds generates noise picked up by the very low level signal sample lines. Although the noise on all lines is almost identical, the common mode rejection at high frequencies is lacking in the differential amplifier. This fact was substantiated by tests made with a Tektronix Differential Preamp. We have concluded from this that a better differential amplifier is necessary to reduce the effects of system noise.

- ② Another source of noise in the system is the integral scanning process. As one scan line leaves the field and a second is introduced, a transient video pulse is produced by the absence of a scan line or the presence of two scan lines in contrast to the video produced by one scan line. These pulses repeatedly excite the filters in a systematic way, acting as "background image signals" through which the true signals must be read. The optical system of the scanner is being rechecked to minimize this effect.
- is this a flow?*

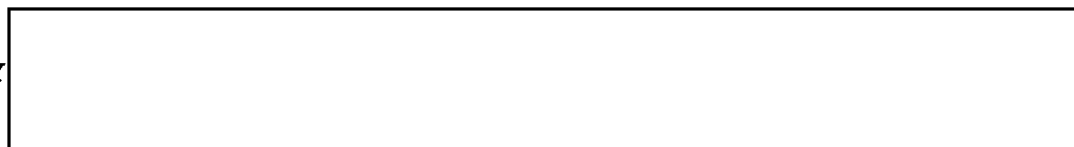
### PROGRAM FOR THE NEXT INTERVAL

During the next interval, the two principal areas of effort will be these: removing the sources of noise in the pre-normalizer to the greatest extent possible and continuing the experimental program with available imagery. A better differential summing amplifier will be constructed to help

remove the switching noise now present in the amplifier. The entire system, including optics, will be rechecked to insure optimum operating conditions at the time final experiments are conducted.

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SUBMITTED BY

A large rectangular box with a black border, used to redact the signature of the Project Engineer.

Project Engineer

Director of Engineering